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**PURDUE
UNIVERSITY** DEPARTMENT OF BIOLOGICAL SCIENCES

Dr. Harmon McAllister
Research Director
The Council of Tobacco Research
USA, Inc.
900 3rd Avenue
New York, N.Y. 10022

April 2, 1991

Dear Dr. McAllister:

A colleague of mine (Dr. James Stoops, University of Texas) recently brought to my attention the fact that the Council of Tobacco Research supports basic research in the biological sciences. I am writing to obtain additional information about the possibility of submitting a proposal for review. Would you please send me any information regarding the scope and goals of your program so I can ascertain if an application for funding is appropriate.

Our research involves the coordinated application of high resolution electron microscopy and image analysis techniques to answer questions related to the structure, assembly and function of biological macromolecules.

An integral aspect of all our studies is a concomitant and concerted effort to improve methods of specimen preparation, microscopy, and the analysis and interpretation of images to allow efficient processing of image data and to insure that structural details of macromolecules are reliably interpreted. We are examining a number of viruses including polyoma, simian virus 40, bovine, human, and rabbit papilloma, herpes simplex and equine herpes, rhesus rotavirus, reovirus serotype 1 (Lang), cowpea mosaic, cowpea chlorotic mottle, cauliflower mosaic, *Nudaurelia β capensis*, *Nudaurelia ω capensis*, and bacteriophages ϕ 29 and ϕ X174.

The cryo-microscopy techniques we currently use involve the preparation of thin specimens that are formed by rapidly freezing aqueous samples into a vitrified state. Samples are maintained at near liquid nitrogen temperature in the microscope while micrographs are recorded under low-irradiation conditions to minimize the damaging effects of the electron beam. Micrographs are then digitized and analyzed in the computer to combine information from several individual particle images to reconstruct the three-dimensional structure of each virus. Cryo-microscopy techniques are preferred over more conventional microscopy techniques because they provide a direct and objective approach to visualize the "native", hydrated structure of biological specimens.

I thank you in advance for your time and look forward to hearing from you soon.

Sincerely yours,

Tim Baker

Tim S. Baker
Associate Professor of Biology
Department of Biological Sciences
Purdue University
West Lafayette, Indiana 47907
(317)-494-5645; (317)-494-0876 (FAX)
TSB@BRAGG.BIO.PURDUE.EDU (EMAIL)



Lilly Hall of Life Sciences
West Lafayette, Indiana 47907